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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/035,928	12/26/2001	Anthony Bessios	Bessios 3	2199
46900	7590	11/10/2005	EXAMINER	
MENDELSON & ASSOCIATES, P.C. 1500 JOHN F. KENNEDY BLVD., SUITE 405 PHILADELPHIA, PA 19102			LEUNG, CHRISTINA Y	
			ART UNIT	PAPER NUMBER
			2633	

DATE MAILED: 11/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/035,928

Applicant(s)

BESSIOS, ANTHONY

Examiner

Christina Y. Leung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 26-35 is/are allowed.
- 6) ☒ Claim(s) 1-3, 5, 10-15, 17 and 22-24 is/are rejected.
- 7) ☒ Claim(s) 4, 6-9, 16 and 18-21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 5, 10-15, 17, and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kayanuma (US 5,561,647 A) in view of Bulow (US 6,016,379 A).

Regarding claim 1, Kayanuma discloses an apparatus for applying compensation to samples received from an optical channel (Figure 1) comprising:

an equalizer 4 having an equalizer response spectrally shaping the samples for compensation to generate a sequence of equalized samples (column 3, lines 8-16);

an error generator 6 generating an error for a current sample based on the difference between 1) an equalized current sample and 2) a decision for the current sample adjusted for a target response, wherein the target response is based on a response of the optical channel (column 3, lines 17-28); and

a combiner (coefficient control circuit 7) configured to combine the error with one or more samples to provide an update signal, wherein the equalizer 4 employs the update signal to adjust the equalizer response to the target response (column 4, lines 29-33).

Regarding claim 13, Kayanuma discloses a method of applying compensation to samples received from an optical channel comprising the steps of:

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(a) spectrally shaping, with an equalizer 4, the samples for compensation to generate a sequence of equalized samples (column 3, lines 8-16);

(b) generating an error (using error calculation circuit 6) for a current sample based on the difference between 1) an equalized current sample and 2) a decision for the current sample adjusted for a target response, wherein the target response is based on a response of the optical channel (column 3, lines 17-28);

(c) combining the error with one or more samples to provide an update signal (using coefficient control circuit 7); and

(d) updating the equalizer with the update signal to adjust the equalizer response to the target response (column 4, lines 29-33).

Regarding claims 1 and 13, Kayanuma discloses that error generator 6 compares an equalized current sample (output from equalizer 4) and a decision for the current sample adjusted for a target response (output from comparator circuit 5). Kayanuma further discloses that the target response is based on a response of the optical channel in the sense that the target response is based on the original incoming signal so that the error calculation circuit 6 can properly provide an error signal based on the output of the comparator circuit.

Further regarding claims 1 and 13, Kayanuma discloses an optical channel comprising an optical signal that is received by optical head 2 and converted to an electrical signal for the above-described distortion compensation in the electrical domain, but Kayanuma does not specifically disclose that the optical signal is received through an optical fiber. However, Bulow teaches that signals passing through a fiber may experience undesired distortion and require compensation (column 1, lines 22-37). Regarding claims 1 and 13, it would have been obvious to

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a person of ordinary skill in the art to use the compensation system and method disclosed by Kayanuma with optical fiber communications such as taught by Bulow in order to correct distortion and errors in signals that had been transmitted over fiber.

Regarding claims 2, 3, 14, and 15, Kayanuma disclose a maximum likelihood sequence estimation (MLSE) detector 8, the MLSE detector generating decoded data from the sequence of equalized samples with an algorithm having transitions based on the target response (column 3, lines 34-48).

Regarding claims 5 and 17, Kayanuma disclose that the equalizer comprises a filter defined by a set of filter taps (column 3, lines 11-13).

Regarding claims 10, 12, 22, and 24, Kayanuma in view of Bulow describe a system and method for applying compensation to samples received from an optical fiber as discussed above with regard to claims 1 and 13. Kayanuma does not specifically further disclose that the system or method is implemented in a receiver of an optical communication terminal or that the equalization accounts for differential group delay of a signal passing through a single mode fiber. However, Bulow further teaches that signals passing through a single mode fiber may experience distortions from differential group delay (column 1, lines 22-37) and further teaches using an equalizer in the receiving end to compensate for this distortion (column 1, lines 49-56).

Regarding claims 10, 12, 22, and 24, it would have been obvious to a person of ordinary skill in the art to use the compensation system and method disclosed by Kayanuma in the receiving end of an optical communication system such as taught by Bulow in order to use the system to correct errors in signals that had been transmitted over fiber.

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Regarding claims 11 and 23, Kayanuma in view of Bulow describe a system and method for applying compensation to samples received from an optical fiber as discussed above with regard to claims 1 and 13, but they do not specifically disclose or teach an integrated circuit. However, it is well understood in the art that electronic circuits with electronic elements such as disclosed by Kayanuma may be implemented as integrated circuits. Regarding claims 11 and 23, it would have been obvious to a person of ordinary skill in the art to implement the circuitry disclosed by Kayanuma as an integrated circuit in the system described by Kayanuma in view of Bulow in order to manufacture the circuit compactly and efficiently.

Regarding claim 25, Kayanuma in view of Bulow describe a method for applying compensation to samples received from an optical fiber with steps as similarly discussed above in detail with regard to claim 13. Kayanuma does not specifically disclose a computer-readable medium executed by a processor to implement this method, but computers are well known in the art, and it is further well understood in the art that electronic circuits such as disclosed by Kayanuma may be controlled with computers/processors. It would have been obvious to a person of ordinary skill in the art to use a processor and computer-readable medium to execute the method already described by Kayanuma in view of Bulow in order to automatically process and compensate the incoming signals.

Allowable Subject Matter

3. Claims 26-35 are allowed.
4. Claims 4, 6-9, 16, and 18-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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5. Reasons for the indication of allowable subject matter were given in the previous Office Action. Examiner notes that all the limitations in newly added claims 26-35 correspond to those in originally filed claims 4, 6-9, 16, 18-21, respectively, and contain subject matter that was indicated allowable in the previous Office Action.

Response to Arguments

6. Applicant's arguments filed 12 August 2005 have been fully considered but they are not persuasive.

7. In response to Applicant's argument that Kayanuma is nonanalogous art, it has been held that a prior art reference must either be in the field of Applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the Applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, like Applicant's recited invention, Kayanuma's disclosed distortion compensation apparatus receives an optical signal, converts it to an electrical signal, and applies compensation in the electrical domain. Although Kayanuma does not specifically disclose optical fibers, the disclosure of Kayanuma is nevertheless clearly directed to Applicant's problem of compensating distortion in an electrical signal that has been converted from an optical signal.

As further discussed in detail in the above rejections, Bulow teaches that optical signals communicated through an optical fiber channel may experience distortion similar to the distortion of the optical signals disclosed by Kayanuma, and it would have been obvious to a person of ordinary skill in the art to use the compensation system and method disclosed by

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Kayanuma with optical fiber communications such as taught by Bulow in order to correct distortion and errors in signals that had been transmitted over fiber.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office Action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Y. Leung whose telephone number is 571-272-3023. The examiner can normally be reached on Monday to Friday, 6:30 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2600.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christina Y Leung
Christina Y Leung
Patent Examiner
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